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A N
INAUGURAL DISSERTATION
ON THE
BILIOUS MALIGNANT FEVER.

READ AT A
PUBLIC EXAMINATION,
HELD BY THE MEDICAL PROFESSORS, BEFORE THE
REV. JOSEPH WILLARD, S.T.D. PRESIDENT,
AND THE
GOVERNORS IN THE UNIVERSITY AT CAMBRIDGE,
FOR THE DEGREE OF BACHELOR IN MEDICINE,

JULY 10, 1797.

✓
BY SAMUEL BROWN, A.M.

“The putrid beams, or some corroding venom,
In countless pores, o’er all the pervious skin
Imbib’d, soon poison the balsamic blood,
And rouse the heart to every fever’s rage.”

PRINTED AT BOSTON,
By MANNING & LORING.

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AN

INAUGURAL DISSERTATION.



IN August, 1796, the town of Boston was visited with a contagious disease of unusual malignancy, the circumstances and marks of which were such as threatened great calamity; and the alarm spread, and became almost universal. This still increased, on observing that in many of its symptoms it bore great resemblance to the fever which had so recently raged at Philadelphia and New-York.

In the preceding fall and winter, inflammatory diseases were frequent in Boston, and in many of the towns in the country, particularly the scarlatina, scarlatina anginosa, and measles. And in the months of June, July and August, or immediately previous to the disease we have mentioned, a species of dysentery was frequent; and now and then

cases

cases

cases of cholera morbus occurred. These were in some places unusually mortal, and prevailed more or less in different parts of Boston till the time of the bilious fever; after which they were known no more.

BEFORE entering more particularly on the subject of the *fever*, I shall introduce some observations on the effects of *poisons*, and their laws of operation on the human system.

OF POISONS.

THESE are substances which either instantly destroy the life of a part or parts of the system, or change the natural functions into morbid actions; and thereby, suddenly or by degrees, affect the whole constitution.

THEY are either *mineral*, *vegetable*, or *animal*.—The damps or mephitic vapours often met with in mines and deep wells, are *mineral poisons*. Of *vegetable poisons* we have a remarkable instance in the Bohan Upas, which grows on the island of Java, belonging to the Dutch. It is so destructively poisonous, we are told, as that the soil for several miles in circumference is whitened with the bones of birds and animals, that have been arrested while attempting to pass through the atmosphere of this shrub of death. *Animal poisons* are of two kinds; original,

original, as that secreted by the viper ; and such as are generated by disease. The latter are, by Mr. Hunter, and afterwards by others, denominated *morbid poisons*.

POISONS are communicated either in a gassous or vaporous state ; or by contact, in the form of pus, or ulcerous matter. Fevers are an example of the former, the venerea of the latter.

THE constitution is never affected, or never takes on the morbid action of the poison, except it be in a state of *predisposition*. Thus, at the time of any raging epidemic, the *miasma* or putrid effluvia is generally dispersed, and different ages, sexes and constitutions are alike exposed ; yet comparatively but few will be infected, while the others escape. How the same constitution should possess different susceptibilities to disease, is best understood from Dr. Brown and Dr. Darwin.

ANIMAL existence, according to Dr. Brown, is endowed with a quality which he names *excitability*, and Dr. Darwin *the spirit of animation*, or *sensorial power*, on which the phenomena of life depend. Every thing which supports life, exerts itself on this principle ; and *vice versa*. It is capable of different degrees of accumulation and exhaustion : it is accumulated by the abstraction of stimuli, and is exhausted by excessive stimuli, or the long application of others acting more moderately. A due proportion between the exciting powers, such as
 heat,

heat, food, air, mental exertion, &c. and the excitability or sensorial power, constitutes health; and every variation from either is disease.

“ There is, they say, and I believe there is,
A spark within us of th’ immortal fire,
That animates and moulds the grosser frame,
And when the body sinks, escapes to heaven,
Its native seat.
Meanwhile this heav’nly particle pervades
The mortal elements, —————
And in its secret conclave, as it feels
The body’s woes and joys, this ruling pow’r
Wields at its will the dull material world,
And is the body’s health or malady.”

WITH many diseases of the variolous kind, there is a certain period between the time the infection is received, and the appearance of the disease; and in this interval scarce any alteration in the actions of life can be perceived. Thus, in the casual small pox, we find a space of about twelve days between the reception of the poisonous effluvia and the first symptoms of the disease. Travellers frequently leave the country where they received the miasma of ague, long before any symptoms of it appear; yet the disposition having been formed, and the poison received, the disease after a certain period makes its appearance.

It sometimes happens, that after the disposition is given and the poison received into the system, the period of eruption, or the time when the disease usually

usually appears, is protracted beyond the usual time, in consequence of the action of other diseases, as the measles, scrophula, &c. This is confirmed by various histories of the small pox.

FURTHER—We have great reason to believe, that not only the morbid action or symptoms of a disease may be suspended, but also that the *susceptibility* may be entirely prevented after the poison is applied. There is a striking proof of this afforded us in the effect of the Harmattan wind, as recorded in the Philosophical Transactions of London.—Seventy negroes were inoculated for the *small pox* three days after the Harmattan set in: none of them had the symptoms of the disease. In a few weeks afterwards, fifty of the same were inoculated, and had the disease; the rest had taken it in the natural way. Here, though the infectious matter was applied to seventy, all of them (as appeared afterwards) constitutionally susceptible of the disease, yet even the local disposition was superceded, and of course the constitution was not infected.*

THE immediately preceding propositions are in proof of a medical axiom established by Dr. Hunter, viz. That the constitution never supports the operation of two distinct diseases at the same time.

IT is a law with most of those poisons which produce their effects by a *critical fever*, that a constitution which has once gone through the action excited by them, is no longer susceptible of it. This

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* Adams on the phagedæna, &c.

is accounted for upon the principle, that the poison is so powerful and active as to destroy the sensibility or life of the part; or that the constitution becomes habituated to the particular stimuli of the poison, and therefore upon a second application to the part or parts of the system, they are undisturbed by or are insensible to it. This will account for the sudden and seemingly miraculous disappearance of epidemics, as was the case at Philadelphia and New-York; for all those who had a susceptibility to the disease have taken it and are not liable to be again affected by it, and those who have not this susceptibility cannot receive it; of course, the prevalence of the disease must suddenly cease.

Poisons, miasma or morbid effluvia are of too subtle a nature for chemical analysis; their constituent materials, and the prevailing or distinguishing principle of each, whether an acid or an alkali, septon or nitrous acid gas, or any other gas, is totally unknown.

VENEREAL and phagedenic poisons, though in the form of fluid discharge and subject to observation, and even to be experimented upon; yet it is equally unknown what material quality constitutes their nature, and renders them capable of their specific effects. Do not most poisons contain a principle of life, which occasions their activity, and by means of which their deleterious effects are produced, when taken into the human system?

Dr.

Dr. Hunter has long since discovered and demonstrated that the digestive organs have no power over substances which have within them the principle of life. There are many circumstances which render probable this opinion respecting poisons, contagious ones in particular. In the *feeb*, animalculæ are probably the cause of this affection. And why may not the *syphilis* be produced in a similar manner, viz. by an accumulated and mixed quantity of seminal animalculæ lodged in those reservoirs and recesses peculiar to the parts concerned? Lodged in this abundance, they may by their own activity insinuate into the system, and form m^l; or they may become putrid, and thus produce the specific venom of the syphilitic disease. Thus also with other animalculæ, introduced by respiration or cuticular absorption.

In the tropical regions, where death has almost an undisputed reign, the atmosphere is generally loaded with myriads of animalculæ; so much so, at certain times in the rainy seasons, as nearly to suffocate the inhabitants. It is then that diseases mostly prevail. Life is always found where there is a congeniality of matter for its reception; and every object in nature, animate and inanimate, healthy or diseased, has its particular sphere of exhalation. This exhalation always partakes of the nature and life of its subject.

HOWEVER homogenous poisons are while they form the atmosphere of the subject from whence

they were exhaled; yet being in contact with other spheres of exhalation, they are blended with other substances which form the common atmosphere; and at length are so equilibrated, by entering into new forms and states, as to lose their activity and power to injure.

It is a universal truth, equally applicable to poisons as to other things, that the more simple and homogenous a substance is, the more powerful and active; and *vice versa*.

THE atmosphere in which we live is made up of exhalations from every individual substance in all the three kingdoms of nature—the animal, vegetable, and mineral: these substances form a perpetual intermediation of *less* and *more subtle*, until they reach the sun himself, the great sensorium of material nature, which by them is nourished and fed, in return for the activity which it imparts. Our atmosphere, in all its extent, becomes blended also with the atmospheres of other planets, and they, in union, form one common atmosphere of the whole system. This idea might be extended so far as to form one general atmosphere for the universe; but this would be filling up Newton's VACUUM, which might expose us to the imputation of philosophical scepticism.

THIS blending the common atmospheres of each planet, and giving them reciprocal influence on each other, may be of use in explaining many of the diseases and affections of the human body, sub-

ject

ject to periodic returns and regular intervals, viz. intermittent fevers, the various species of menorrhagia, epistaxis, and hæmorrhoids. A late writer has observed, that the paroxysms of fevers shew themselves in a greater degree of violence about the full and change of the moon, that is to say, about three days and an half before and after, including at each period a space of about seven days, than during the interval between these periods. Also—That the paroxysms of fevers occurring during the periods described, are constantly more violent about mid-day and midnight, than during the intervals between these spaces.—That some remarkable abatement in the violence of the paroxysm never fails to take place, upon the expiration of the full and change of the moon.—That the paroxysms of fevers, whilst they abate in violence upon the expiration of the full and change, shift also their attack to a later hour.—That epilepsy, insanity, paralytic affections, asthmas, phthical coughs, with a variety of other complaints, often assumed an intermittent form, and returned regularly with the full and change of the moon, and disappeared or diminished during the intervals.

THIS sol-lunar influence has been noticed by the ingenious author of *Zoonomia*; and perhaps better accounted for than by any predecessor.

MOST of the above observations are capable of satisfactory proof, and have long been acknowledged by the best medical writers; so that they may be considered

considered as so many medical axioms. They may be of use in considering our subject—on which I now enter.

I HAVE observed, that the fever, when it made its first appearance, shewed strong marks of malignancy. The patient, after some hours of unusual dullness or dead heavy sensation in the head, and great reluctance for any voluntary motion, felt great commotion and uneasiness at the stomach, which constantly increased till vomiting commenced. At each of the several vomitings, attended with severe writhings, much bilious matter was thrown up; and there was found, in many instances, a porraceous substance, resembling the settlings of coffee. The stomach shewed unusual symptoms of irritability, it being almost impossible to keep down for a moment the mildest medicine that could be administered. In the intervals of vomiting, particularly, a constant and greatly exhausting pain was felt; most exquisite at the small of the back, and extending along the spine and its connexions quite up to the occiput. Pain of head continuing, especially over the eyes and under the temporal bones, sometimes with a sensation as if some instrument had passed the head. Respiration extremely difficult, often with a feel of suffocation. Heat very great, especially in the thorax and region of the liver. Pulse morbidly rapid. Pores closed. Skin smooth, and apparently distended

ed with the expanded fluids and heat within; having a tinge, somewhat resembling that of chlorotic patients. The cornea albuginea most resembling, in colour, that of dusky glass when held up to the light. The eyes, however, expressed much concern, and often moved with a furious rapidity in the early stage of the disease. These all increased, if possible, in violence till death put an end to the patient's sufferings; or gradually subsided, when the fever vanished, and health was restored.

THOUGH these were the characteristic symptoms of the disease, yet they were generally variant in their commencement, progress and termination, according to the difference of temperament; and also according to the difference in the predisposing causes.

SLIGHT symptoms, scarcely noticed by the patient or his friends, were sometimes the harbingers of this fever: Also, languor, yawning, dejection of spirits, sleep disturbed and not refreshing, appetite impaired, disagreeable taste and smell, and uncommon sensibility to cold, were sometimes among the early symptoms of the disease. In others the symptoms were more rapid and intense; persons sometimes being roused from sleep by a most torturous sensation in the stomach, near its connexion with the duodenum, resembling liquid fire spreading over this viscus and extending, in the direction of the arteries, quite through both upper and lower extremities.

SOME

SOME were affected with alternations of heat and cold; with others, the heat was continual. The appearance of the tongue was various; sometimes it was moist, as in catarrhal defluxion; at other times was parched and dry. The breath, however, was invariably disagreeable, and sometimes so offensive as to be almost intolerable to the patient himself. Pulse often various in the same persons; sometimes having the regularity and force of synocha; at other times weak, fluttering, indistinct and vibratory; manifesting very great debility. Costiveness prevailed with the most, especially in the first stages of the fever; and all the secretions and excretions partook of the great disorder of the system. None were in a healthy state; all either in a high degree of excess, or greatly diminished.

OTHER symptoms, more particular, might be enumerated; but they would neither direct to a rational *indication*, nor assist to form a probable

PROGNOSIS.

THE symptoms which might be considered as the heralds of approaching death, were excruciating pain in the loins, through the spine, and in all the larger or principal muscles. Excessive irritability of the stomach, so much so as to refuse all access to medicine. Great pain over the eyes and in the eye-balls; this pain increasing to delirium or madness.

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The pupil of the eye dilated, and the patient stretched on his back—limbs extended and motionless.

ON the contrary, if these symptoms were neither excessive nor lasting, the patient's strength retained, and spirits supported by the exhilarating power of hope, and a confident expectation of recovery, and no deficiency of duty in doctor or nurse, he was seldom disappointed : the termination was favourable.

PROXIMATE OR EXCITING CAUSE.

THIS, in my opinion, is morbid effluvia, first lodged in the saliva ; thence conveyed and lodged in the stomach and intestines ; here either perverting or totally destroying the digestive powers of these viscera : thereby a putrid and highly corrosive mass is generated, instead of a mild and bland substance to give nourishment to animal life. The surrounding blood vessels feel the change and are affected. The mesenteric veins, especially, from contiguity, become loaded with a putrid mass of indigested substances, which are conveyed through the venæ portarum into the liver. This important viscus becomes disordered ; the bile is thrown into the intestines and up into the stomach in unusual quantities and in an acrid state. This still increases the difficulty ; the stomach and bowels are heated and inflamed, and puking ensues. The venæ hepaticæ empty a heterogeneous mass of black damaged fluid into the right ventricle, which is immediately
thrown

thrown into the lungs. The lungs, in turn, are affected by the disorder; the patulous mouths of the absorbing vessels are closed by pressure on the substance of the lungs from the fluid within. The blood no longer receives its congenial nourishment; but is conveyed by the veins of the lungs into the left ventricle of the heart; and, if this Alpha and Omega of animal life has not lost its power, is thence distributed in a highly putrid state into the several parts of the body. The whole vascular system is thrown into irritation and commotion by unusual stimuli; the mass of blood is destroyed, and the patient dies: Or, the powers of life, collected as in a focus, act with accumulated force, subdue the offending causes, separate and discharge the impurities by the several emunctories, and the patient recovers.

THAT the miasma is first lodged in the saliva, and thence carried into the stomach and bowels is probable from this circumstance; we often hear persons complain, after being over an infected subject, that they not only *smell* the putrid exhalations, but *tasted* them for a long time afterwards; and that nothing would remove the disagreeable taste. Probably, however, a part of the contagion finds a direct way into the mass of blood through the absorbents of the lungs.

THAT the morbid miasma, when thrown into the body, in the manner we have mentioned, are capable of the effects we have ascribed to them, is not difficult

throw

difficult to conceive, especially if they contain a principle of specific life. Life acting against life, is like the meeting of two opposite powers in nature, in which case the one will destroy the other; and where life is destroyed putrefaction will take place, whence a contagion may arise too great for the remaining power of life to reject or remove, which of course will in its turn be either impaired or destroyed. Besides, we know that persons are often thrown into the most distressing disorders by worms and animalculæ lodged in the stomach and bowels in an oviform state, in consequence of eating raw fruit and other uncooked substances. These also may and often do concur to make human contagion more fatal.

THAT the stomach and bowels are the *first* affected, is evident from the severe pain that is early felt in the loins, and from the early tendency to puking.

THAT the liver is affected is evident from the large discharges of bilious matter by the stomach and stool; and that the lungs are, is plain from the difficult respiration, which was always an attendant symptom of the disease. In all the subjects dead of the yellow fever, that have been dissected, the liver and the lungs had almost universally a morbid appearance. The lungs were inflamed, and the liver either greatly swollen or very much shrunk.

THAT the heart is greatly affected, is plainly manifest from the rapidity of the pulse.

THAT the life of the blood is either greatly impaired or totally destroyed, is manifest from the pains in the muscles and in the head ; from delirium and coma ; from vibices, petechiæ and yellowness of the skin, &c.

DR. Anthony Fothergill, however, says, in opposition to Drs. Harvey, Willis, Hunter, and others, that "the blood is not alive, but is a mere passive inorganic mass." Thus he proves it: "Life, he says, is allowed on all hands to be the attribute of an organized body alone, and if blood be an organized body, then it is an animal ; and if so, here is a living animal destined to circulate within the vessels of another living animal !" This is an attempt by a few words to dissipate a numerous train of facts and arguments, and to render illegitimate an opinion which I *did* think was the result of close observation and skilful experiment.

If, however, life is the attribute of an organized body *alone* ; yet this organized body is composed of parts, of which the blood is one ; and therefore has its share of life. But,

FURTHER on, Dr. Fothergill, in his ingenious treatise, (for such we esteem it in general) denies his major proposition. He says, "The nervous influence, sensibility, or as Dr. Darwin elegantly expresses it, *the spirit of animation*, cannot be a secreted fluid, since the brain is no longer allowed by anatomists to be a secretory organ. Neither
can

can its origin be proved to be coeval with the un-
formed rudiments of the embryo* when the "*dim
speck*"

* Dr. Darwin is fully of the opinion that the rudiments or living ens of the future embryo is derived wholly from the male parent; that this ens or rudiment consists of a living filament or stamen, and that this filament, of whatever form it may be, is endued with the *capability* of being excited into action by certain kinds of stimulus. Roused into activity by the stimulus of the nutritive and congenial fluid in which it is received from the male parent, it receives new adaptations or accretions of substances, and thus becomes organized. With every new change of organic form or addition of organic parts, a new kind of irritability or of sensibility [which is only a more general sensation] is produced; these varieties of irritability or of sensibility exist in our adult state in the glands; [perhaps in all the parts of distinct functions] every one of which is furnished with an irritability, or a taste, or appetency, and a consequent mode of action peculiar to itself. These changes increase, and additions of parts with their peculiar irritabilities or appetencies and consequent modes of action, continue in progressive order till the embryo is complete in form. The parts most essential to life are first produced. Thus, the brain to dispense the powers of life, next the heart, then the lungs, and from these all the parts of the system, according to the importance of their functions in the animal economy. Sec. 39, Vol. I.

Thus then it seems to be the opinion of Dr. Darwin that the *esse* or essence of the embryo is from the male parent, and that the *existere*, or existence, is from the female parent; of this there is no want of proof convincing. This *esse*, or as Dr. Darwin names it, *living ens*, always possesses the *conatus* or *endeavour* to assume a form similar to the male parent or progenitor, which it always will do when lodged in the proper matrix or mould, and supplied with the congenial nourishment; this, with animals, is always from the female. Perhaps Dr. Darwin means the same thing by "the *capability of being excited into action by certain stimuli*." This *conatus* or *endeavour* of the *seminal germ* to produce or assume the form of its progenitor exists not only with every order, genera, species and creature of the animal kingdom, but also with every order, genera, species and thing of the vegetable kingdom. Thus every creature and thing is preserved in its order and distinction. This preservation by generation and prolification, production and reproduction, and consequent increase and multiplication, suggests and impresses most strongly the idea of *infinity* and *eternity*, and clearly evinces the wisdom and goodness of the "CAUSE OF ALL CAUSES! PARENT OF PARENTS! ENS ENTIVUM!"

speck of entity" first becomes visible, for then no vestige of brain or nerves can be discovered." *Nervous influence* before any *nerves* or *brain* can be discovered!!—But he asks, Must it not be referred then to vital air or spirit of the atmosphere, emphatically termed in the sacred page, the *breath of life*, and by ancient philosophers, "*divinæ particula aëræ*," drawn into the lungs at the first effort of respiration?" Here the Doctor takes the life from the organized body, of which he before asserted it is the attribute alone, and transfers it to *vital air* or spirit of the atmosphere, which is not proved to be more an organized body than the blood.*

WE might here interrogate the Doctor how it is that the foetus moves itself and makes various exertions in utero, if it is without the spirit of animation before the first effort of respiration?

SOME medical gentlemen object to our method of accounting for the introduction of contagious miasma

* It is not to be denied that the passages in the sacred writings referred to by Dr. Pöthergill may indeed admit of the construction he puts upon them, it being customary in those writings to ascribe the cause instrumental for the cause principal; and the air is the medium by which respiration exists, and the active life of the body. But then this cannot be all that is signified by those words, as is evident from the text being in the plural number, and hence they have been more properly considered by divines, as having relation to the life of the soul, from which the life of the body is derived, and which consists in the perception of what is good and what is true, or the will of good, and the perception of truth; thus, a *soul of lives*. The expression of this *soul of lives* being breathed into Adam by the Almighty, seems also fully to denote, that man is only an organ of life, and not life itself; for life and light are not creatable, but man was created a form receptive of life, as the eye is a form receptive of light.

miasma into the system, and say that it is more probably applied immediately to the *powers of life* or *nervous influence*. What is the nervous influence? whence is it derived? and through what medium do we reach it? These are questions I never have yet seen satisfactorily answered by any medical writer that has made the attempt.

WE have seen, above, the reasoning of an ingenious and learned physician on this subject. He asserts that the *nervous influence* exists before any *vestige* of *brain* or *nerves* can be traced, and therefore concludes that it must be derived from oxygen, or spirit of the atmosphere!

DR. Cullen says, "the nervous power seems different from every thing else in our body, and seems not peculiar to it, but a general principle in nature particularly *modified* in our system." What produces this particular modification? the nervous power? for he acknowledges none higher; if so, nervous power modifies nervous power!

He again says—"The vital power is intimately connected with the *sensorium commune*, and this with the soul, which certainly is of use in the medical system, though by no means a rational conductor." Here I cannot comprehend the Doctor's meaning; but I suspect his thoughts at this time were electrified; and if by his *soul*, I agree that it is not always a rational conductor.

DR.

DR. Gallen thinks also, that "the soul influences the body not as a *prime mover*, but as a modifier of external senses." What higher power than the modifier of external senses, which all exist from interior life? But again—

THE Doctor is of opinion that "all our functions are governed by certain laws, that we may observe and distinctly mark, so as to know their consequences; so that the *consideration* of the soul, in a medical view, is of no weight." And why not? By what power are those *laws established*, which govern all our functions?

ONCE more—" *Medicamentum non agit in cadaver*," says the Doctor; which is, in English phraseology, Medicine operates only on life; and yet he agrees with Dr. Boerhaave, that "when a problem is traced up to the connexion between soul and body, there we ought to stop, and consider it as resolved." Some of the above problems cannot be either solved or resolved, even by this connexion. But I think this is the very point from which we ought to set out, if we ever expect rightly to investigate the phenomena of life.

WHAT is the soul but life? and again, what is life? "*Cogito, ergo sum*," said Des Cartes—We can only know it by its operations, *principally* within ourselves. It is the soul or life which sees, feels, hears, tastes, is sensible of pleasure or pain, determines our limbs to motion, &c. wills, thinks and knows.

knows. If it be asked how and whence it is derived to the body? I can at present only reply by pointing to some of its more interior effects. Observe, then, the dominion and influence the mind has over all the most important functions, which support the economy of life. It actuates the body in all its parts at pleasure. The mind directs the ear to hear, disposes the eyes to see, moves the tongue and lips to speak, and the hands to do whatever it pleases. Thus the body is nothing but obedience to the mind; but can it be thus unless there were a most intimate connexion between the mind and the body? not such a connexion as is between what is above and what is below, as oil on water, but such a connexion as exists between cause and effect, the one produced from the other. Every one, the least skilled in anatomy, must have learnt how entirely every part and function of the human system is actuated and lives by the cardiac and pulmonic motions. But these two motions are entirely subject to the two constituent principles or powers of the mind, viz. the will and the understanding. The will is immediately operative in all the series of catenated motions denominated involuntary; but the heart exhibits most distinctly the will's influence in the system. Its motions are slow or rapid, calm or tumultuous, according to the various affections of the will; of this we have sensible proof by means of the pulse.

EVERY one who has seen the force of *love*, (which resides wholly in the will, and, as a general principle
comprehending

comprehending every kind of affection, is in fact its life) knows how it actuates the body by its power over the heart's motions ; producing, when intense, delirium, phrenzy, apoplexy, and sometimes death. When the love glows, the body is warm, the variations of the heat of the body always tallying with the variations of love or affection, whatever be its object, from the *freezing point*, or the extinction of love, to any indefinite degree of intenseness.

THE understanding or thinking principle of the mind influences mainly the pulmonic motions. Thus, if we think tacitly, we breathe tacitly ; if we think deeply, we breathe deeply ; we draw in and relax, compress and elevate our lungs either slowly, eagerly, mildly or attentively, in perfect conformity to the different states of the thoughts. Now it is a maxim of true philosophy, that what is superior in power is prior in existence, and that the controlling force does not originate from the thing controlled : This is also agreeable to every rule of just conclusion. Where the residence of the mind is fixed, we have no other way of investigating, but to trace the nerves to where they begin and end ; for all our sensation is transmitted by means of those nerves called sensory nerves, to the inward sensorium, and so to the understanding. Thus the sensations go by the optic nerves from the eyes ; and from the nostrils by the olfactory nerves, or *processus mammillaris* ; from the ears by the auditory nerves, and so on. Therefore, that the beginning and ending may be found, we must examine all the brain, and

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not desist till we find the ends and beginnings of the nerves. Having, therefore, dissected the brain, we meet with little spheres, round, or fully wrapped inward and outward, commonly called the cortical glands, where the nerves begin and end, and where the mind in its principles resides, and acts from the beginnings of all the nerves; for to these spheres, as to their ultimate ends, all the nerves are centered. Thence the mind deduces and collects all the modes of appearance and operation transmitted by the senses, and thence distributes them round to the interior perception and understanding. All the nerves, whatever be their office, are formed and produced from these glands; wherefore this is our common sensorium: from hence also proceeds our intimate sense, or understanding, which perceives by its senses, thinks on what it perceives; and judging on what it thinks, chooses what is judged best; from what it chooses, desires; and lastly, from the will of its desire, acts. That the mind or spirit thus resides in its principles in the brain, and in its principles in the body, is manifest from experience; for the glands being affected, the whole appendix of the brain and body languish in proportion, the power of imagination is stupefied; the cogitations languish; the memory fails; the determinations of the will hesitate; the desires fail, and the senses are dulled. But notwithstanding this defect in the operations of the mind in consequence of defect in the organization of the brain, it is not to be thence inferred that the mind itself is nothing more than ma-

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terial organization, however highly sublimated; for we hold the soul or mind, though giving life to the body, to be perfectly distinct from it in degree, bearing the same relation to it as what is prior to what is posterior, or, as cause and effect; so that one is in the other not in continuous but in discrete order. Hence it follows, that though the latter can have no existence without the former, yet the former can exist without the latter, as is the case when the body is entirely rejected at death. But till then the mind is so far dependent on the body, that it cannot manifest its operation in outward nature, unless by rightly disposed organs; and if there be impediments in the corporeal organs, the perfection of the mind will also be impeded during its connexion with them, through a want of afflux and re-agency; for it is a received law, that influx is proportioned to afflux, agency to re-agency, &c.

THE powers of life then which manifest themselves in the body, we have just reason to conclude are derived wholly from the mind, and flow solely from a spiritual origin, the mind itself or soul being probably an organized form, but spiritual, perfectly distinct from the natural, though in it in every part throughout, and communicating life thereto; which life the soul itself receives by continual influx from Deity, "in whom we live and move and have our being." Thus much on the question, What is life, and whence derived?*

LIFE

* If the above observations be true, how evidently does the fallacy of that reasoning appear, which, not distinguishing the discrete degrees of

LIFE then is in all and every part of the body; but some parts are endowed with a much greater share than others. In the brain it is as it were drawn to a focus. Indeed it is here, as we have just observed, that fibre begins and circulation ends; consequently here also is the connexion between fibre and blood. No doubt, when the blood arrives at the brain it becomes highly refined, and imparts a sublimated matter, which becomes the immediate recipient of life, whence it is distributed by the nerves to all the parts in the curious mechanism of man down to the ultimates of life. Now we have already observed, the less simple and homogeneous any substance is, the more liable it is to injury and perversion. Dr. Hunter has shown that the serum of the blood is a mass of heterogeneous substances, and is the lowest form of animal life; therefore is the most liable to be affected by disease. The serum is derived immediately from the alimentary canal. There it is that contagion first plants itself, and

of the operation of life, but stopping at proximate causes from the inductions of analysis only, makes no distinction betwixt the life of a man and that of a brute. For if it be admitted, (and nothing can be more easily admitted, nor more fully confirmed from the united testimony of revelation, reason, and experience) that man is distinguished from the brutes by the faculty of thinking, not only analytically but synthetically, and thereby of living not only the sensual and natural, but also the moral and spiritual life, it may be rationally concluded, that the same distinction prevails in regard to the faculty of living eternally. For it must, on the same ground, be inferred, that he possesses a superior degree of life or a form receptive of life more immediately from the Deity, whence he derives the capacity of being conjoined with the Deity by acknowledgment and affection, thus, by re-agency on his part; whence he consequently also possesses the faculty of retaining the insistent life, and in this retention consists the ground of his eternal existence.

and therefore the alimentary canal may well be called the store-house of contagion. Here, like the skilful but cautious enemy, it commences its operations by progressively invading the weaker parts, until the inner fortresses of life are endangered.

THERE are many directly and indirectly debilitating powers, which prepare the constitution for the reception of disease, and are therefore called

REMOTE OR PREDISPOSING CAUSES.

AMONG the directly debilitating powers, we reckon cold or the absence of heat, the greatest; its effects, however, are always proportionate to the degree of intensity, and the state of the constitution on which it acts.

A LARGE variety of injecta are of a sedative or debilitating nature; plants in particular; all kinds of raw fallads, except those of a spicy or aromatic nature. Vegetable food, when too dilute; drinks in large quantities, that are not spirituous; an impure atmosphere; sloth, ennui, a habit of inactivity, a mind unemployed, &c. &c.

EVACUATIONS, when immoderate or unnatural, are greatly debilitating; such as the various species of epistaxis, menorrhagia, hemorrhoids; also from the excretory organs and alimentary canal.

SLEEP, that is not forced, is occasioned by the abstraction of stimuli, and therefore, when too much

much indulged, produces weakness. There are also a variety of mental qualities, which operate as sedatives on the body. Fear is the greatest: It has been known totally to unhinge the mind's fabric, suspend all motion, and in fact every animal faculty, inasmuch as to produce syncope or swoons, and even death; disappointments, of whatever kind; also despondency, with many others. These are the most common among this class of directly weakening powers.

THE indirectly debilitating powers are—First, of the mind. Immoderate desires of whatever kind; great mental exertion; a fixed attention to one train of thought; anger in excess. Unlimited indulgence of sensual appetites is highly pernicious to the body, and certainly destructive of the mind's happiness. An excess in eating, or, as it is better expressed, gormandizing, especially upon food that is loaded with the richest spices and most powerful stimulants, is certainly injurious to the constitution, and prepares it for the invasion of almost every species of disease.

WHAT a mass of heterogeneous substances are thrown into the stomach at even a *common meal*! The consequences are—*Bellum internum*; “the war of elements and the crush of” life at least.

“For other ills the ambiguous feast pursue,
Besides provoking the lascivious taste.

Such various foods, though harmless each alone,
Each other violate; and oft we see

What strife is brew'd, and what pernicious bane,
From combinations of innoxious things.”

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THE powers of life, by this mode of living, are strained to the highest pitch, and when exposed to disease, the constitution has no new or unemployed force to repel the enemy. The strength collapses, debility or exhaustion, with all its sad consequences, ensue. It is to this circumstance, mainly, we are to ascribe the unusual mortality of contagious diseases which have of late prevailed in several capitals of the United States.

HEAT, in excess, is the greatest stimulus that operates on life; indeed it is the most powerful agent in nature; by it "rocks fall to dust, and mountains melt away." When above 80° of Fahrenheit, it always injures.

ALL spirituous liquors, if used with frequency; also labour, when it induces fatigue; and indeed great bodily exertion, of whatever kind, impairs the strength and gives susceptibility to disease.

BUT we pass to the

TREATMENT, OR METHOD OF CURE.

THE symptoms of the fever which we have described certainly manifest a very high degree of vascular irritability and excitement; the first and leading indication, therefore, is depletion by powerful evacuations, even to bleeding; and this with all possible speed. Jalap and calomel were early used for this purpose by the most celebrated practitioners of Boston, who

who I believe can give fresh testimony of the propriety and benefit of the use of this medicine, first recommended by Dr. Rush, of Philadelphia. Myself have witnessed the most happy effects of this cathartic, when used agreeably to the judicious directions of my preceptor.

It is now generally thought that mercury, as used in this disorder, produces its salutary effects chiefly by operating as a quick and powerful cathartic, when combined with jalap; thereby causing a large and sudden depletion of the intestines and the excretories that here empty themselves. It is moreover certain that mercury in all its operations, always affects the liver more or less. I believe that in the bilious fever it has almost a specific effect upon this viscus by changing its morbid actions and restoring its healthy functions, which, it cannot be doubted, are greatly deranged.

Dr. Rush enumerates the effects of the use of jalap and calomel in this fever as follows. 1. It raised the pulse when low, and reduced it when it was preternaturally tense or full. 2. It revived and strengthened the patient. 3. It abated the paroxysm of the fever. 4. It frequently produced sweats when given on the first and second day of the fever. 5. It sometimes checked that vomiting which occurs in the beginning of the disorder; and it always assisted in preventing the more alarming occurrence of this symptom about the 4th and 5th day. 6. It removed obstructions in the lymphatic system.

system. 7. It prevented in most cases a yellowness of the skin, by discharging the bile through the bowels as soon and as fast as it was secreted.

THE usual dose, and I believe the best proportioned for an adult, was jalap 25gr. calomel 10gr. The intention for which this was given was not answered unless it produced four or five discharges.

No other regard is to be paid to time in the administration of this medicine than that it be given as early in the disease as possible. If it should be rejected, or is slow in the operation, opening injections should be administered every one or two hours. One dose was sometimes sufficient to open the bowels; several, however, were more frequently necessary, as the dose was often thrown up by puking. In bilious fevers, there seems to be a constant reproduction of morbid bile; once cleansing the bowels, therefore, is not sufficient; it will be proper to give a purge once a day as long as the fever lasts. After one or two effectual doses of jalap and calomel, as circumstances require, other cathartics may be used; such as Glauber's salt, cremor tartar, rhubarb, senna, manna, &c. either separate or combined.

To assuage the great heat of this fever, cloths dipped in cold vinegar, or vinegar and water, applied to the surface of the body have been found to do great service.

SOME have recommended flannel shirts wet in this manner to be kept constantly applied. And
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it has been practised by many physicians, particularly Dr. Trotter, of England with manifest advantage. It certainly has a tendency to extract the heat from the body, which always, in proportion to its intensity, expands the teguments, thereby closes the pores by increasing the density; of course perspiration ceases.

THE pain of the head, very distressing in this complaint, was greatly moderated by similar applications of cold water, or vinegar and water, to the pained part, neck and back.

DRINKS should be freely used during the inflammatory state of the disorder, to assist the operation of the physic, and to lessen the heat within. Almost any kind of tea is proper, such as marsh mallows, balm, &c. lemonade, tamarind water, toast in water, apple in water, may be drank with safety and advantage.

FOOD of all kinds is extremely improper until the crisis, unless it is unusually protracted; and even then it should be of the most innocent kind, and very cautiously administered.

THE utmost pains should be taken with the patient in respect to cleanliness. Stools should be immediately removed; the linen well aired and shifted as often as once a day. The chamber should be as large as can be had, and constantly ventilated.

BLEEDING in the first stage of the fever is strongly recommended by Dr. Rush and others. It was

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practised

practised by them with much apparent success. But in Boston, the last summer, it was not so much relied on as a necessary part of the cure : I believe because the fever was less inflammatory. The jalap and calomel in large doses was found, in most cases, sufficiently depleting to take off the excitement and irritability of the vascular system.

Dr. Chisholm, in his treatment of the fever at Grenada, found that bleeding was by no means admissible, and different antiphlogistics were ineffectual. His whole dependence was upon mercury, which he gave in pills, composed of five grains of calomel, two of antimonial powder, and one of opium. This was repeated to the same extent, eight times in twenty-four hours. The propriety of this practice was justified by the success, for if salivation was speedily raised, the danger was removed and the patient recovered.

NEXT to calomel in this form Dr. C. reckons vitriolic æther the most beneficial. He gave it in the following manner : a teaspoonful in half a wine glass full of cold water. After this the patient was kept undisturbed for two hours, when the dose was repeated ; and, in this manner, it was continued every two or three hours, till the spasm of the stomach was entirely overcome. Given as above, he found it extremely grateful to the patient, and that thirst, nausea, and oppression often fled before it.

SHOULD

SHOULD the fever change, in consequence of the excessive stimulus of the morbid miasma, from the inflammatory or synochus type, and become typhoid, then the tonic and stimulating plan must be pursued. The signs of this change are the loss of voice; tremulous motion of the tongue, or putting it out; the patient muttering to himself; catching at the bed-clothes, sighing, weeping, and sometimes laughing; difficult deglutition; paralysis of the sphincter muscles; tremors; convulsions; syncope on being raised upright; gangrene of blistered parts; profuse diarrhoea; dark coloured urine; eye-balls fixed and sunk; the countenance shrunk, lengthened, ghastly, and discoloured; inside of the mouth and tongue black and parched; deafness, or hearing very acute; the jaw fallen; immobility of the joints; watchfulness or constant sleep; heaving of the breast; rattling of the throat; pulse felt only at intervals.

I WOULD, however, interpose a caution against the use of the diffusible stimuli, unless an immediately favourable turn of the disease can be gained by them.

THIS subduing one stimulus, (especially if it has gained ascendancy even over life, which is always the case when an inflammatory fever changes to a typhus) by the superior force of another stimulus, is like placing a person in time of battle between the two fires. It is much safer to let the powers of the constitution become quiescent for a time, un-
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til they recover force to withstand the disease: Or, let the stimulus of the disease act till the constitution, from the power of habit, can adapt itself to the peculiar nature of the stimulus, and thereby escape destruction.

BRANDY and water, or porter and water, when agreeable to the stomach, snake-root tea, now and then a cup of chicken, veal, or mutton broth, may be used in restoring the tone of the system.

IN most cases of debility it is proper to wrap the limbs in flannel dipped in warm spirits; also to apply cataplasms of bruised garlick or onion with mustard seed to the feet. But the principal dependence, next to the use of mercurial medicines, for exciting a healthy action in the arterial system, should be on mild and gently stimulating food.

“ ——— While the vital fire
Burns feebly, heap not the green fuel on;
But prudently foment the wand’ring spark
With what the *soonest* feeds its kindred touch:
Be frugal even of that; a little give
At first; that kindled, add a little more;
Till, by delib’rate nourishing, the flame
Reviv’d with all its wonted vigor, glows.”

To allay the puking, always greatly exhausting to the patient in the bilious fever, a blister applied to the pit of the stomach often had the desired effect. Liquid laudanum with sweet oil applied to the

the same place, gives relief where the stomach is affected by pain only.

THAT I may be sure of something *valuable* on the disease of which I am treating, I insert the following cases taken from Medical Observations by Dr. JOHN WARREN, my preceptor, whose medical abilities are deservedly in high public estimation; communicated first to the American Academy of Arts and Sciences, and by their order to the public. July 1st, 1797.

CASE I.

THE first appearance of the disease was on the 25th of August, 1796, in a family at the easterly part of the town of *Boston*, near a considerable extent of flats, which are daily exposed for some hours to the action of the sun.

A LADY of this family was the first victim to the disease. She was seized with rigors, a general distress throughout the whole system, with a white and moist tongue, dry skin, frequent and weak pulse; but without any very alarming appearance until the third day, when the pains, which now became more severe, with laborious respiration, a slight redness of the eyes, a sleepiness and insensibility, followed at night by a sudden sinking, and intermission of the pulse, announced the extreme hazard of her situation. Active cathartics were prescribed

prescribed in the beginning, and a blister was applied over the whole anterior part of the thorax, but no benefit was derived from either, and she died at the end of the fourth day.

CASE II.

THE next person attacked was a female of the same family. She was taken sick within twelve hours of the first, with pains in the head, back, and lower extremities; a vomiting, which continued incessant through every stage of her illness, great oppression at the breast, a weak and quick pulse, moist skin, and yellow tongue. Opium and calomel, with other purgative medicines, were administered, without having been a moment retained in the stomach. Her pulse became intermittent on the third day; and on the fourth, a fatal termination ensued.

VARIOUS CASES.

ON the 2d September a son-in-law of the above mentioned lady, was seized with a fever of the same kind; and within three days from that time, his wife, and her two brothers, all of whom had been closely attentive on their deceased mother. Three of these were treated with large and repeated doses of jalap and calomel; two of the three took emetics; one of them was bathed with cold water, dashed over the whole body on the third day from the attack, and having been kept cool, they

they all recovered. The fourth was in a situation peculiarly unfavourable when attacked; she took such doses of jalap and calomel, as were thought best adapted to her state; and on the fourth day she died.

THE case of Mr. Newell, who was taken with the disease, 18th September excited much apprehensions in town. On the fourth day the skin became yellow; on the sixth petechiæ were discovered over all parts of his body; and a most obstinate dysentery followed by colliquative diarrhœa proved fatal on the 8th day.

WITH many patients, after slight rigors, and obscure pain in the head, for the first twenty-four hours, together with a sense of heat or burning at the stomach—a hæmorrhage from the nose often took place, and continued to be a troublesome circumstance for several days, without any remarkable mitigation of the symptoms. In these cases, spontaneous vomitings rarely occurred—but when they did, large quantities of bile were thrown up from the stomach. In two cases only, what is called the black vomit, took place.

PROPHYLAXIS.

TO prevent infection, all those things which are reckoned predisposing should be carefully avoided. Some of these I have enumerated, under the head of *predisposing causes*.

DIET.

DIET.—All gross food, especially meats, when prepared with spices and pepper stimuli, which greatly inflame the blood, and fit it for disease, are to be avoided. Food should be chiefly vegetables, cooked in a simple manner.

DRINKS should be mostly of the acid kind. Porter is good; tamarind water; cream of tartar in water; apple in water, &c. But the drink which most effectually allays thirst, and perhaps is as safe and healthful as any, because both nutritive and diluting, is simply milk and water, equal parts. These drinks will serve to keep the body in a regular order, neither too lax, nor too costive, a point which should be closely attended to. Should either of these states of the body prevail, it must be remedied by the proper medicines.

THE exhalations of putrid or putrifying matter, also pools and puddles of stagnant water, must be carefully shunned.

ALL possible attention must be paid to cleanliness of body, by frequently shifting the linen, and washing off perspiration by frequent bathings in water of a middle temperature, or the temperature of the surrounding air.

THE purity of the common atmosphere should be preserved with all possible diligence, by emptying and cleansing the cellars, streets, drains, ditches, vaults, &c. &c.

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THE chambers of the sick *must* be visited as much as humanity and the convenience of the sick require, and no more. When the sick are visited, all the windows and doors should be opened.

DR. CHISHOLM, who has written a treatise on the yellow fever, as it appeared in the island of Grenada, 1795, thinks that the effluvia of infectious diseases do not extend themselves beyond a limited distance from the person or thing from which they are emitted, so as to produce disease : This distance he thinks may be fixed at the utmost from six to ten feet.

He observed, *1^{stly}*, That when the disease had entered a dwelling, avoiding the chamber of the sick, prevented the infection. *2^{dly}*, That merely entering the chamber of the sick, without approaching near to the diseased person, never communicated infection. *3^{dly}*, That approaching so near the diseased person as to be sensible of the foetor of his breath, or of the peculiar smell which is always emitted from the bodies of the sick, or touching the bed clothes on which he lays, generally occasioned nausea, slight rigors, and often head-ach, at the moment, and some hours afterwards, produced the disease itself. *4^{thly}*, That actual contact, so that the perspired fluid of the sick person might adhere to the hands, &c. of the healthy person, more certainly produced the disease. *5^{thly}*, That touching the wearing apparel of a person actually diseased, or who had just recovered from the disease,

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communicated

communicated infection as certainly as actual contact of the skin. 6^{thly}, That the merely passing an infected person, or one who wore the clothes he had on, when labouring under the disease, if the effluvia proceeding from them were blown upon him, produced the disease.

FROM the united testimony of Dr. Warren, Dr. Rush, and Dr. Chisholm, it appears, that the contagion always acts within four days after its application to the body.

WHETHER THE MIASMA OR CONTAGIOUS MATTER OF THE BILIOUS MALIGNANT FEVER, OF WHICH WE HAVE TREATED, IS AN IMPORTED OR A HOME PRODUCTION ?

A NEW doctrine has lately been broached by Dr. Mitchel, of New-York, respecting the cause of malignant diseases, making it septon, or septous acid.*

AN inaugural dissertation by Dr. William Bay, citizen of New-York, has just come to hand, and is declaredly a branch of this doctrine. His subject is the Dysentery. The work is worthy attentive perusal. But we are not convinced, as the author seems

* IN Dr. Mitchel's nomenclature, we find *septon* substituted for *azote* or *nitrogen*; *septous gas* for *azotic gas* or *atmospherical mephitic*; *gaseous oxyd of septon*, for *dephlogisticated nitrous air*; *septic gas*, for *nitrous gas*; *septous acid* for *nitrous acid*; *septic acid*, for *nitric acid*; *septate*, *septite*, for *nitrate*, *nitrite*, &c.

seems to be, that the diseases arising from the exhalations of dead animal and some vegetable substances are not putrid; nor that the principle of putrefaction is *not putrefactive*; nor again, that septon is antiseptic. See pages 9 and 10 of the introduction.

THESE notions, however, Professor Mitchill himself advances and endeavours to support, as may be seen from the following paragraph, taken from the above treatise, page 99. appendix, A.

He says,—“I reject altogether the notion of *putridity*, as it is *very generally supposed* to be going on in the blood vessels; I have no faith in the introduction of *putrid ferments* into the mass of fluids. A putrefactive process taking place in the contained parts of the living body except among the contents of the alimentary canal, is incompatible with life more than a few minutes. Putrefaction is a resolution of an organic body into its elementary atoms or into new compounds. Now many of these are gasses whose extrication in the blood-vessels would extinguish life in a very short time. Besides, the fluids produced by putrefaction having already undergone that operation, cannot be any more susceptible of it. They not only do not putrefy the muscles, but, in the common acceptation of the term, they retard putrefaction in other substances. Thus, *fixed air, nitrous acid, and volatile alkali*, which are reckoned among the most active *products of putrefaction*, are known to be the most powerful opposers
of

of it. And it may be laid down as a pretty broad fact, that such substances as are *septic in their origin*, are antiseptic in their effects; and this from the nature of things."

I AM not satisfied with this reasoning, neither do I think it conclusive. "A putrefactive process taking place in the contained parts of the living body is incompatible with life for more than a few minutes." The duration of life, while the putrefactive process is going on in the body, is wholly according to the violence or rapidity of the process. But if the putrefactive process is so incompatible with life, why reject the idea of *putrid ferments* in the mass of fluids? and why not call those diseases so suddenly destructive to life, *putrid*? and why say, that the very principle or cause of these diseases, which, from its supposed effects, is called septon, is antiseptic?

WE grant that putrefaction is incompatible with life; and if it becomes general, the whole life is extinguished. But it may exist in a *part* of the body without a total and immediate extinction of the *whole* life. If this were not the case, how came the idea of ulcerous putrefaction? It is allowed by all, that putrefaction may exist in the alimentary canal; perhaps always, in some degree. It is here, however, that those substances are selected and taken up, which afterwards receive and retain life, and become a part of the body. This lacteal fluid, when there is a high degree of putrefaction in the *prima*
via,

via, may in all probability become putrid, as it comes from the source of putrefaction : next the ferum ; and so on, till the whole mass of fluids becomes corrupted, and life escapes. Or, in the Doctor's own words, " Can it possibly happen that pestilential fluids shall come in contact with the lungs, skin and intestines, whose surfaces are thickly beset with absorbent vessels ; and that their noxious matters shall remain around the orifices of those inhaling tubes for a very long time, and yet no atom or particle of them be taken in ? Will not a portion of them be sucked up by the lacteals from the intestines, and by the lymphatics from the other exposed surfaces of the body, and through their channels be conveyed into the *mass of blood* ? will not the *blood*, on receiving these *foreign materials*, assume *new qualities*, and, as it travels the round of circulation, carry with it mischief and venom to the nervous system." p. 92. More than this I conceive was never understood by *putrid ferments* in the mass of fluids.

IN page 98, the Doctor seems to admit the same idea (if possible more fully, perhaps too much so) for he there gives it as his opinion that " the septic gas does not produce death by its inflammatory action on the superficial muscles, but by its being mixed in a certain quantity with the *blood* ; and after conversion to septic or septic acid, by conjunction with oxygen in circulating through the lungs, STIMULATING THE HEART TO DEATH, and utterly destroying *all* the irritability of that muscle." Greater

er phenomena were never expected or known from the most rapid putrefaction in its most violent stage; and all this the Doctor allows is done within the vessels of the circulating fluid. First the septic gas is converted into septous or septic acid, and then the deleterious effect is not by an inflammatory action on the superficial muscles, but by **STIMULATING THE HEART'S MUSCLES TO DEATH!** This, it is observed in the same page, can be done in the course of half a minute!

He observes further, "that it must not be imagined, that, after pestilential venom is inhaled into the *blood-vessels*, death will in all cases be the consequence. The offending matter may be carried from the body through the *excretory* outlets; or it may circulate a long time with the other *fluids*, and so *season* both the *vessels* and the *heart* to its action, that after a while, *they*, like the *external parts*, will grow *insensible to its stimulus*, and no longer have their motions disturbed by it."—How can Dr. Mitchill deny the existence of putrid ferments in the mass of fluids, after saying all this?

BUT I do not fully understand, how it is that the offending matter *seasons* both the vessels and the heart to its actions, when just before it killed them both!

WE grant that the life of a part, which has been destroyed by deleterious stimuli or putrefaction, may be restored or renewed by the application of congenial matter, and abstracting the offending cause; but

but otherwise the interior organization will be deranged, and the whole life destroyed.

I HOLD it as a truth that there is no life but in some form;* and the animal life of man has its *peculiar*

* An eminent Swedish author, to whose writings I acknowledge myself indebted for the ground of some other observations made in this work, reasons thus: Not only animal and vegetable life have their peculiar forms, but also spiritual existences; even thoughts and affections have their appropriate and distinctive forms. These latter, viz., thoughts and affections, are commonly but unintelligibly denominated abstract things, when in fact they are no more abstracted from their appropriate, spiritual, or substantial forms, than vision is abstracted from its organ the eye, or hearing from its organ the ear. But these forms, however, have nothing of gross materiality in them, therefore are not discerned by bodily sight. But it may be asked, what is affection and what is thought, in their substantiate forms or subjects. A satisfactory answer may be deduced from all and every thing in the body, where there are many viscera, each fixed in its particular situation, and which operate their functions by changes and variations of their state and form. That the viscera are severally employed in their respective operations, is well known; the stomach in operating its functions, and so the intestines, the kidneys, the liver, the pancreas, and spleen in theirs; and likewise the heart and lungs, each in its respective office: and all these motions are operated only intrinsically or within themselves, and to be moved intrinsically is to operate by variations of state and form. Hence it may appear, that the purely organic forms or substances of the mind are of a similar nature, only with this difference, that the operations of the organic substances of the body are natural, and those of the organic forms of the mind spiritual, and that both of these act as one by correspondences. There can be no ocular demonstration of the changes and variations of state and form in the organic substances of the mind, which are affections, but yet they may be seen as it were in a glass, by the changes and variations of the state of the lungs in speaking and singing, there being a correspondence, inasmuch as the sound of the voice in speaking and singing, and also the articulations of sound, which are words in speech, and the modulations of the voice in singing, are effected by the lungs; sound corresponds to affection, and speech to thought; they are also produced thereby, and this is done by changes and variations of the state and form of the organic substances of the lungs,

culiar form; this form consists of almost an infinitude of parts, all possessing a *vita propria*, or a life peculiar to their functions, which is derived from the *common* life which resides in the *sensorium* or brain; for the life of all the parts is *one*, as much as all the parts are one body. Now let any venomous substance be applied to any one of these parts, and the *whole life* is affected from the injury done to the part; and this, because the *whole* is connected with every part,

lungs, and from the lungs by the trachea or wind-pipe in the larynx and glottis, and afterwards in the tongue, and lastly in the mouth and lips. The first changes and variations of the state and form of sound are produced in the lungs, the second in the trachea and larynx, the third in the glottis by various openings of its orifice, the fourth in the tongue by its various applications to the palate and teeth, the fifth in the lips by disposing them in various forms: Hence it may appear, that the mere changes and variations of the state of organic forms, successively continued, produce sounds and the articulations thereof, which are speech and singing. Now, forasmuch as sound and speech are produced from no other source than from the affections and thoughts of the mind (for from the latter the former exist, and never without them) it is evident that the affections of the will are changes and variations of the purely organic substances of the mind, and that the thoughts of the understanding are changes and variations of the form of their substances; similar to what hath just been instanced in the lungs.

FORASMUCH as affections and thoughts are mere changes of the state of the forms of the mind, it follows, that the memory is nothing else but the permanent state thereof; for all changes and variations of state in organic substances are of such a nature, that when once they become habitual they are permanent; thus the lungs are habituated to produce various sounds in the trachea and to vary them in the glottis, to articulate them in the tongue, and to modify them in the mouth, and when those organs are once habituated to them, they are in them and can be reproduced. See treatise on Divine Providence, No. 279. Published by Thomas and Andrews at Boston, 1796.

To me the above reasoning is satisfactory. Something, in a degree similar, may be seen in Dr. Darwin's *Zoonomia*, vol. 1st. sect. 4 to 12. His ideas, however, are not *new*; but his experiments are original and ingenious, and his proofs more in detail.

part, and every part with the *whole*. This, however, is greater or less in proportion as the part is connected either remotely or nearly with interior or central life. Thus, poisons applied directly to the heart, soon destroy its motions, and produce death; applied to the brain, the effect is still more sudden. But poisons, however active, never can affect these organs, except through fluid media: I doubt whether there is any perception by the nerves, but in this way. Now,

DEATH never happens, or in other words animal life never leaves its material form, until this form is impaired by having its more subtle and animated principles or materials perverted or corrupted; especially those which reside in the brain and are derived from the *blood* or through this medium. This certainly is the case with all malignant diseases. Nor does this idea differ widely from Dr. Mitchill's notion of *putrid ferments* or *putrefaction*, which he defines, "a resolution of an organic body into its elementary atoms."

WHETHER *septon* or *septic acid* really is the cause of malignant diseases, is problematical; experiments and future observations have yet to decide. Neither the affirmative nor negative is yet clearly or satisfactorily proved.

I SUSPECT Dr. Mitchill has been led to adopt his opinion of the cause of pestilential diseases mostly from *appearances*: Thus it is found that all those

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spots and soils, where nitre is produced in greatest abundance, are unhealthy, viz. Egypt, Persia, and the East-Indies. But it does not follow, that because diseases are connected with the soil in which nitre is found, that it is, in any shape or form, the cause of these diseases. Nitre is commonly thought to be the *result* or *residuum* of putrefactions, and is very seldom found in a vaporous or unsaturated state, in which it *must be* when taken into the system by cuticular absorbents, or inhaled by the lungs in respiration. But I shall be answered, that septon or the radical of nitre is saturated by *oxygen* or *vital air*, which is taken from the atmosphere, and thereby made unhealthy. But this would make hydrogen (inflammable air) the cause of these diseases; for then this gas would be in undue proportion.

SOME probable reason might be brought in support of the opinion that oxygen or vital air, whatever be the substance with which it is combined, may be highly injurious, if not the cause proximate of many diseases, when in over proportion; although it is in other circumstances undeniably the great supporter of life and health. It is certain that it gives causticity to every preparation that acts as such on the human system. Without oxygen there is no putrefaction, no change or waste of substance; no corrosion, rust, or decay of metals or minerals.

GREEN peas, green corn, &c. when gluttonously eaten, have been known to produce a most distressing

ing *diarrhoea*; and not unfrequently a *cholera morbus*. These substances are said to contain much oxygen.

WHICH, therefore, of the above principles has the greatest share in the production of diseases, will not be decided, until some standard, or *Gasmètre*, shall be invented, by which it can be known what is the peculiar state of the atmosphere when they prevail.

It is somewhat singular that the same principles, which by physicians in America is considered as the cause of pestilential diseases, in Europe is extolled as a sovereign remedy for their cure and prevention.

BUT more directly to the point in question.—By some physicians it has been strenuously contended, and with much ingenuity of reasoning, that the fever of Philadelphia, New-York and Boston had its origin in those places. Others say that it originated from *fumes* of foreign import.

THE same causes must every where produce the same effects; and the same noxious substances in one place will produce the same disorders as in another, all other circumstances being the same.

THAT there may be, in either of the above mentioned capitals, such a peculiar state of the atmosphere, or such a combination of noxious substances as will give rise to contagious diseases, cannot be disputed.

disputed. But it is within the southern or middle latitudes that these diseases most commonly have their origin. It is here that we find material qualities in a more naked and uncombined state, consequently more powerfully active. Here putrefaction is sudden, and vegetation rapid. Here also is the region of elementary contention and violence; hurricanes, tornadoes, sulphureous explosions, volcanoes, and earthquakes. Every species of tropical wind has its peculiar diseases, the Monsoons, Harmattan, Samiel, &c. The winds of these regions vary their terrors; sometimes involving all things in a suffocating heat; sometimes mixing all the elements of fire, air, water, earth together; sometimes with a momentary swiftness passing over the face of the country, and destroying all things in their passage.

AT Minorca and Gibraltar the winds which at times blow there from the interior of the country are very destructive, and at the Falkland Islands an extraordinary wind is felt, occasionally, so blasting as to cut the herbage down, equal to the raging of fire; the leaves are parched and crumbled to dust. So at Goree, on the river Senegal, there is an easterly wind from the inland parts, with which those who are suddenly met by it in the face are scorched, as by a blast from a furnace.

BUT beyond all others in its dreadful effects, is the *Samiel*, or mortifying wind, of the deserts near Bagdad. The camels, either by instinct or experience,

ence, have notice of its approach, and are so well aware of it, that they are said to make an unusual noise, and cover up their noses in the sand. To escape its effects, travellers throw themselves as close as possible to the ground, and wait till it has passed by, which is commonly in a few minutes. As soon as they, who have life, dare to rise again, they examine how it fares with their companions, by plucking at their arms or legs ; for if they are destroyed by the wind, their limbs are absolutely mortified, and will come asunder. See Adams's Philosophical Lectures.

In northern latitudes the atmosphere is uniformly temperate and neutral ; and if there are malignant diseases, here originated, it must be more in consequence of idleness, neglect of cleanliness, internal and external, or some moral default, than of situation,

All this being agreeable to fact, the opinion that the miasma of malignant diseases, more especially the one of which we have treated, is imported from some sultry climate, seems most probable.

Few capitals, perhaps none, are more heathfully situated than Boston. It is on a peninsula, and constantly ventilated on all sides by water breezes. The streets almost all are so much inclined as to be washed and cleansed by every shower. None—or very few places where filth can collect and stagnate without great neglect of scavenger duty. On the
west

west side is a large common of 20 acres or more extent covered with verdure, with a mall adjoining: A spot more beautiful and recreative is not found in any country. A walk here may well be called a healthful luxury.

An elegant State-house, and other rich buildings; the surrounding back country, with its hills and vales; the intervening waters, and other agreeable objects which diversify the prospect, all unite to render this place extremely delightful.

Thus favourably circumstanced, to what must it be owing, should Boston be again visited with contagious malady? No doubt to street filth and other impurities which adulterate and destroy the healthy qualities of the air, and render it a fit vehicle for the circulation and extension of the pests of diseases, here originated, or, introduced from southern climates.

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